

REMARKS

Claims 1-32, 34-36 and 38-49 remain in this application. Claim 33 has been canceled by this amendment, and claim 37 has been canceled by a previous amendment. In view of the foregoing amendments and remarks that follow, reconsideration and timely indication of allowance of the remaining claims are respectfully requested.

Claims 1-14, 21-31, 36 and 39-49 have been allowed.

Claims 18, 19, 34 and 35 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In response, claim 34 has been rewritten in independent form, and therefore, claims 34 and 35 are no longer dependent on a rejected claim. Applicants have elected not to amend claim 18 and 19 because Applicants believe that the claims from which they depend are patentable for the reasons set forth below. Accordingly, Applicants respectfully request that the objections be withdrawn.

Claims 15-17 have been rejected under 35 U.S.C. 102(e) as allegedly being unpatentable over Sih et al. (US 6,608,858). Claim 20 has been rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Sih in view of what is allegedly well established in the art. Claim 38 has been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Gurantz et al. (US 5,550,869) in view of Sih. Claims 32 and 33 have been rejected under 35 U.S.C. 102(e) as allegedly being unpatentable over Cox et al. (US 6,693,953). In view of this amendment, and the remarks that follow, Applicants respectfully traverse these rejections as they apply to the claims remaining in this case.

In wireless communication systems, transmitted signals are reflected and scattered by obstacles in their path, resulting in multiple copies, or multiple instances, of the same signal arriving at the receiver. These multiple copies, however, took different paths, so they arrive at the receiver offset in time. Improved performance may be achieved if the various signal instances can be processed and combined in a manner such that more signal energy is collected for a given signal transmission.

Applicants have disclosed a novel and unobvious approach for processing and combining the signal energy of multiple signal instances of a signal transmission. This may be achieved with a delay lock loop that extracts timing information from each of the signal instances, and uses the timing information to synchronize a local clock to sample a digitally interpolated representation of the received signal. In particular, the timing error between the received signal clock and the sample timing generated by a timing generator may be determined for each signal instance and combined in a loop filter. The output of the loop filter may be used to synchronize the timing generator to sample the interpolation of the received signal. To reduce jitter, the delay lock loop may be operated in an “enhanced mode.” In the enhanced mode, the sample timing is adjusted only if it would result in a better signal-to-interference-and-noise ratio (SINR).

Referring now to the specific claims, Applicants submit that they recite subject matter which is neither disclosed nor suggested by the art of record. Consider claims 15-17 and 20, which recite, either expressly or by way of reference, “deriving the *sample timing* for the plurality of signal instances based on an output of the loop filter.” (emphasis added).

The Patent Office takes the position that claims 15-17 and 20 read on Sih. However, Sih has nothing to do with deriving *sample timing* for a received signal. Rather, Sih is directed to a

frequency tracking loop. In Sih, a loop filter is used to adjust the RF and IF frequency synthesizers to remove residual frequency offsets in the digital baseband signal, and not to derive *sample timing*. Accordingly, Applicants respectfully request that this rejection be withdrawn.

Claim 33, as amended, recites a method of deriving sample timing for a received signal capable of operating in a plurality of modes including an “*enhanced* mode.” (emphasis added). The meaning of the term “*enhanced* mode” is clear from the specification. It means a mode of operation in which the sample timing is adjusted for a signal instance in response to an error metric derived for the signal instance only if it would improve the SINR for the signal instance. (See Patent Application, p.2, ¶ [1106] and p.17, ¶ [1075]). This definition has been added to claim 33 by amendment to expedite the prosecution of the case, although it is not required under a proper claim construction.

The Patent Office asserts that claim 33 reads on Cox. However, Cox does not teach or suggest a method of deriving sample timing for a received signal having an enhanced mode of operation that allows the sample timing to be adjusted only if the SINR for the signal instance would be improved. Rather, Cox teaches reducing the duty cycle of the delay lock loop when the timing error is small to save power. Therefore, Applicants respectfully request that this rejection be withdrawn.

Claim 38 recites a pilot processor operative to “derive an error metric for each of a *plurality of signal instances*” and “a *loop filter operative to combine error metrics . . .* to provide a composite error metric.” (emphasis added).

The Patent Office further asserts that claim 38 reads on the combination of Gurantz and Sih. According to the Patent Office, Gurantz teaches all the elements of claim 38 except for the

scaling of each error metric. The Patent Office relies on Shi for this feature arguing that it would have been obvious to one skilled in the art at the time the invention was made to modify Gurantz to scale the error metrics. Even assuming, *arguendo*, that the proposed combination is legally proper, a *prima facie* case would still not be established because the proposed combination fails to yield the claimed invention.

Gurantz discloses a demodulator which uses a symbol tracker to adjust the clock of an A/D converter. However, it is totally devoid of any teaching whatsoever to a method for adjusting the sample timing in a system that combines multiple signal instances arriving at the receiver at different times due to reflections and scattering of the signal. In particular, Gurantz does not disclose or suggest deriving an error metric for each of a *plurality of signal instances*. To the extent that Gurantz derives an error metric at all, it does it for *one signal instance*. And since Gurantz derives, at most, an error metric for only one signal instance, it cannot be said that Gurantz discloses *combining error metrics*. Accordingly, Applicants respectfully request that this rejection be withdrawn.

REQUEST FOR ALLOWANCE

In view of the foregoing, Applicant submits that all pending claims in the application are patentable. Accordingly, reconsideration and allowance of this application is earnestly solicited. Should any issues remain unresolved, the Examiner is encouraged to telephone the undersigned at the number provided below.

Respectfully submitted,

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